Environmental Assessment
Feral Swine Damage Management
In Hawaii County

Lead Agency and Preparer: U.S. Department of Agriculture
Animal and Plant Health Inspection Services
Wildlife Services

Cooperating Agencies: State of Hawaii
Department of Land and Natural Resources
Division of Forestry and Wildlife

County of Hawaii
Department of Research and Development

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CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.1 Introduction

The County of Hawaii, Department of Research and Development (Hawaii County R&D) has requested the assistance of United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services program (Wildlife Services) to respond to an increasing level of complaints and manage the damages and threats by feral swine (*Sus scrofa*) on the Island of Hawaii (Hawaii County) in the State of Hawaii. Feral swine are commonly termed feral pigs, feral hogs, and wild boars.

Wildlife Services is the federal program authorized to carry out wildlife control programs necessary to protect the Nation's agricultural and other resources. The primary statutory authorities are the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c). Wildlife Services program provides Federal leadership in helping to solve problems that occur when human activity and wildlife are in conflict with one another.

1.2 Purpose

The purpose of this environmental assessment (EA) is to analyze the environmental effects of the Wildlife Services proposed program and alternatives to manage feral swine damage on the Island of Hawaii.

Objectives The objectives of the proposed control program is to reduce localized damages on residential, agricultural, and public properties within the County of Hawaii that have threats or damages from feral swine to property, agriculture, natural resources and human health and safety. The primary objective of the Wildlife Services program is to assist Hawaii County R&D with providing wildlife damage management services where requested. A 12-month pilot program is being proposed per Hawaii County Council Resolution 134-07 to assess the feasibility and effectiveness of a government sanctioned, island-wide feral swine damage management program.

Based on public concerns that have been received to date, it should be stressed that the objective of the proposal is to manage localized damages only. *Eradication is NOT an objective of the program*, nor is feral swine damage management proposed in public hunting areas.

The one-year pilot program is intended to provide information to Wildlife Services and the County of Hawaii so that they may better determine the nature and extent of damages, and so that the County of Hawaii may develop longer term solutions to manage ongoing damages if a need continues to exist. The County assistance program is not expected to continue after the pilot program in terms of current funding, but other sources of funding and assistance will be explored. Other sources that may be considered include private operators responding to requests for assistance, increased hunting opportunities, and/or

private agreements with a continued Wildlife Services program. These options are discussed in detail under Section 2, alternatives, and Section 5, conclusions. Wildlife Services will provide recommendations to the County about existing damages and options for solutions if needed after the pilot program results are evaluated.

Decision to Be Made

USDA Wildlife Services is the lead agency for this proposal and will make decisions based on this environmental analysis. The cooperating agencies and the public have had input into the development of this EA. Based on the analysis contained in the EA, Wildlife Services will answer these questions:

- How can USDA Wildlife Services and the cooperating agencies best respond to the public requests to manage damages from feral swine on the Island of Hawaii?

- What are the environmental effects associated with the proposed action and alternatives? What interests and environmental resources might be affected?

- Might the proposal have significant impacts and require the preparation of an Environmental Impact Statement for the implementation of a control program?

1.3 Need for Action

Increasing calls for assistance

The County of Hawaii based its request for assistance to Wildlife Services on an increasing and overwhelming volume of complaints from residents about damages and threats from feral swine in Hawaii County. Based on the increasing number of complaints in communities throughout east and west Hawaii County, the Hawaii County Council members unanimously voted to pass a resolution to provide funding for a one year program to address the citizen's requests for assistance with feral swine damages (personal communications with D. Yagong, D. Ley and D. Hopkins, September 30, 2007). The Hawaii Department of Land and Natural Resources was not equipped to respond to the volume of requests for assistance, and therefore the County of Hawaii entered into agreement with the Wildlife Services program to assist with resolving the conflicts. Within two months of establishing a hotline to record complaints, Wildlife Services received over 240 calls from individual residences requesting assistance in alleviating feral swine damage (personal communication with S. Veriato, September 2007).

Nature of the damages

Public complaints in Hawaii County are based on frustration with swine damage to landscaping, taro fields, macadamia nut and fruit orchards, and vegetable gardens. In addition to property and crop damage, county residents have increasingly complained that

they fear for the safety of young children and the elderly, due to the aggressive nature of feral swine. Feral swine have attacked and been a threat to livestock in the county, and in one reported case, attacked and injured a horse (D. Yagong, personal communication). Government officials and others are also concerned about the presence of diseases in feral swine that can be transmitted to livestock, people, and pets.

Potential damages by feral pigs

Hawaii is not alone in its concerns about a growing feral swine problem. Concerns are increasingly raised nationally about the substantial destructive role that the animals play in the form of crop damage, livestock predation, environmental degradation, and disease transmission, primarily swine brucellosis and pseudorabies. Feral swine can be efficient predators. Calves, kids, lambs, and poultry have been known to become prey of feral swine (Stevens 1996, Beech 1993). Feral swine may adversely affect stream ecosystems by causing erosion which increases sedimentation in streams, thereby negatively affecting wildlife that depends on clear water. The number of feral swine is not known in Hawaii, but the growing feral hog population in the nation is thought to be greater than 4 million animals currently, and Wildlife Services has taken an increased number of feral swine each year to assist with damage management (Clay 2007).

Rooting and foraging by feral swine results in damage to crops and natural ecosystems. Feral hogs forage by turning over large volumes of the soil's surface (Ditchkoff and West 2007). Numerous sources site erosion, injury to native plants, and invasion of non-native plants from soil disturbance by feral swine (Cushman et al. 2004, Kaller and Kelso 2006, Kaller et al. 2007, Sweitzer and Van Vuren 2002, Waithman et al. 1999, Updike and Waithman 1996, Tolleson et al. 1995). Feral pigs are responsible for an estimated $800 million or more in damage each year to agricultural commodities in the United States (Coblentz and Bouska, 2004, Pimentel et al., 2000). Agricultural commodities that require irrigation, or have fruits, nuts or rhizomes can attract land use and crop depredation by feral pigs (Coblentz and Bouska, 2004). Feral swine populations can serve as reservoirs and vectors of diseases including swine brucellosis and pseudorabies which are transmissible to livestock, wildlife, pets, and/or humans (APHIS 1991).

Brucellosis is a bacterial disease which is mainly spread among animals, but humans can become infected by coming in contact with contaminated animals or animal products. Brucellosis is rare in humans in the United States (Center for Food Security and Public Health 2003), but hunters may be infected through skin wounds or by accidentally ingesting the bacteria after cleaning infected animals. Hunters should take precautions such as using rubber gloves when skinning and gutting animals (Hawaii State Department of Health (2005). There are various species of the bacteria *Brucella* that can affect different animals, but most are associated with a limited number of hosts. *Brucella suis* is the species that infects domestic and feral pigs and it can occasionally affect horses (CFSPH 2003) and can be seen in dogs, cattle, bison and reindeer (USDA-APHIS-VS 2002). Swine brucellosis causes chronic inflammatory lesions in the reproductive organs and in the bones. Clinical disease includes lameness, paralysis, abortion, and birth of

dead or weak piglets (USDA-APHIS-VS 2002, CFSPH 2003). *B. suis* biovar 1 and 3 are highly pathogenic and can cause severe disease in humans (USDA-APHIS-WS 2002).

Pseudorabies is a disease of swine that can also affect cattle, horses, dogs, cats, sheep, and goats. The disease is caused by pseudorabies virus (PRV) which causes reproductive problems, including abortion, stillbirths, and even occasional death losses in hogs. Pseudorabies is not contagious to humans. The PRV is primarily spread through direct animal-to-animal (or nose-to-nose) contact between an infected and shedding pig and a non infected animal. If present on inanimate objects, such as boots, clothing, feed, trucks, and equipment, the virus can also spread from herd to herd and farm to farm. Currently, all 50 states are considered to be free of PRV in commercial production swine herds (USDA APHIS-Veterinary Services 2007). Under the action alternatives, Wildlife Services would cooperate with the Hawaii Department of Agriculture to help determine the presence and/or extent of PRV in feral swine in Hawaii County.

Possible reasons for increased damages in Hawaii County

Wildlife Services and other government agencies suspect that the recent increasing level of damages and complaints on Hawaii's largest island is due in part to the changing land use systems that have occurred in recent years. Until recently, large scale sugarcane plantations usually grew monotypic crops adjacent to public hunting areas and allowed hunter access to control pig populations. Sugar management included burning the crop residues which also helped to keep swine numbers down within the plantations. The sugar plantations were closed and the land was converted to small, private residential and diversified agricultural parcels where private landowners partially or fully restricted access to hunters. Private parcels provide excellent feral swine habitat due to ample vegetative cover, hunting restrictions, and inclusion of diversified crops, landscaping, gardens, and animals that attract and provide food sources to feral swine. This, along with expanding residential developments into previously forested and agricultural lands, has contributed to the increase in human-wildlife interactions within the County

1.4 Social Benefits of Feral Swine

While many in the scientific and conservation communities consider feral swine to be a destructive pest, many residents consider feral swine as a resource that possesses important economic and social values. Many people in Hawaii are interested in the sport hunting opportunity provided by feral swine. Hunting provides direct economic benefits from license fees as well as indirect benefits associated with travel, lodging, associated services and purchases. Hunters spent an estimated $20,081,000 in Hawaii according to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFWS 2007). Another group that values the opportunity to hunt feral pigs includes those in rural communities, including native Hawaiian groups, often in rural areas who take advantage of the opportunity to harvest feral swine and consider it to be an important supplement to the diets of their families. Finally, the pig in Hawaii is an important culinary focal point in local celebrations. Some families in Hawaii that use feral pigs to

supplement their diets are on limited incomes and consider hunting to be an important source of food for their families.

1.5 Location and Scope of Analysis

This EA evaluates the Wildlife Service feral swine damage control program that could occur at various properties in present or future programs throughout the Island of Hawaii. The immediate proposal includes a focus area in residential areas and agricultural areas, with the potential to remove feral pigs from the grounds of public institutions (e.g. schools or parks). No federal or state lands, other than school grounds would receive direct control assistance under this proposal. The EA will address the one year pilot project and the potential to continue damage management activities at a yet to be determined but less intensive program after the first year if the actions, issues, and impacts fall within those described in this EA.

This EA analyzes various alternatives and methods by which feral swine control could be carried out to reduce or eliminate individuals and localized populations to protect agriculture, private property, public property, natural resources and human health and safety. The potential methods that may be used and the aspects of the human environment that could be affected are discussed in Chapters 2, 3 and 4.

1.6 Summary of Public Involvement Efforts

Public participation in the National Environmental Policy Act (NEPA) process for this proposal was conducted consistent with the lead agency's NEPA procedures. The public involvement and notification process was threefold:

Wildlife Services has assisted Hawaii County with coordinating and facilitating public meetings at several locations throughout the island. County of Hawaii officials and subject matter experts of the Hawaii Department of Agriculture (HDOA), Division of Animal Industry (HDOA AI) and the Department of Health were included in these meetings to provide key information on the proposed program as well as zoonotic disease information important to human health protection. Hawaii County and State officials participated in public meetings in Hamakua, Kona, Puna and Hilo to take public comments and to provide information about the proposal.

Issues related to the proposed action were identified during the public informational meetings and during meetings with cooperating agencies. During the development of the draft EA, Wildlife Services consulted with HDOA AI, Hawaii County R&D and Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR DFW) to further identify preliminary issues and information for the environmental analyses.

A notice of the availability of this EA was mailed to all groups and individuals who are known to be interested in this proposal (land management agencies, conservation

organizations, hunter groups, individuals, regulatory agencies, and other groups and individuals). Notices were published in the Honolulu Advertiser for three consecutive days beginning on January 22, 2008. Notices were also posted in the Hilo Tribune Herald and West Hawaii Today the same week. In addition, a notice inviting public comment and the pre-decision document were placed on the Wildlife Services website at (http://www.aphis.usda.gov/regulations/ws/ws_nepa_environmental_documents.shtml). All substantive comments will be considered and addressed in the decision and or final EA.

1.7 Related Environmental Documents

ADC Programmatic Environmental Impact Statement (EIS). Wildlife Services (formerly called Animal Damage Control (ADC)) issued a Final EIS on the national Wildlife Services program (USDA 1997a, revised). Pertinent and current information available in the EIS has been incorporated by reference into this EA.

Environmental Assessment: Protecting Property, Health and Safety from Nuisance Wildlife in Hawaii. Wildlife Services, Honolulu, Hawaii, July 30, 1999. This EA addresses feral pig damage management in the State of Hawaii on a small scale and some work to respond to requests for assistance was initiated under the resulting decision document.

Environmental Assessment: Wildlife Damage Management to Protect Hawaiian Agriculture. Wildlife Services, Honolulu, Hawaii, 1998. Feral swine damage management is addressed on a smaller scale than under the proposed action and some work to respond to requests for assistance was initiated under the resulting decision document.

The cumulative impacts analyses in this EA will consider the effects of the proposed action on all resources evaluated in the document, including pertinent issues evaluated in the above EAs.

1.8 Authority and Compliance

Based on agency relationships, missions, and legislative mandates, Wildlife Services is the lead agency and decision maker for this EA, and therefore responsible for the EA's scope, content, and outcome. As cooperating and consulting agencies, the Hawaii County R&D, DLNR DFW, and HDOA AI, provided input towards the development of this EA.

1.8.1 Authority of Lead and Cooperating Agencies

USDA APHIS Wildlife Services The Wildlife Services program of the Animal and Plant Health Inspection Service, U.S. Department of Agriculture is the federal agency authorized to manage damages when wildlife threaten natural resources, agriculture and human health and safety. The primary authority for APHIS-WS is

the The Act of March 2, 1931 (7 U.S.C. 426-426b; c. 370, § 1, 46 Stat. 1468-69; Dec 13, 1991, Pub. L. 102-237, Title X, § 1013(d), 105 Stat. 1901, as amended Oct. 28, 2000, Pub. L. 106-387, § 1(a) [Title VII], § 767], 114 Stat. 1549) and The Rural Development, Agriculture and Related Agencies Appropriations Act of 1988 (7 U.S.C. 426c; Pub. L. 100-202, § 101(k) [Title 1], Dec. 22, 1987, 101 Stat. 1329-331).

Hawaii County Department of Research and Deveopment The Hawaii County Department of Research and Development is a county department authorized with providing the necessary leadership related to the County's planning, policies, goals and actions in sustainable economic, societal and environmental practices (Hawaii County Code, Article 8, Section 2-36, (2005 Edition, as amended)). Pursuant to that authority, the Hawaii County Department of Research and Development's primary objective throughout this project is to assist residents, agricultural farms and public institutions within the County of Hawaii that are posed with human health and safety threats, nuisances, property damage and agricultural damage associated with feral pigs. In order to meet their objectives, the Department of Research and Development, on behalf of the County of Hawaii, may enter into contractual agreements pursuant to Hawaii Revised Statutes Section 46-1.5(4). Additionally, Hawai`i County Council Resolution 134-07, Draft 2 authorized the Department of Research and Development and a designated council member to contract with and coordinate with the United States Department of Agriculture, Wildlife Services to formulate a one-year pilot program to trap invasive feral pig populations within Hawaii island residential communities and agricultural farm lots.

Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife

The Department of Land and Natural Resources, Division of Forestry and Wildlife is the state agency authorized to manage wildlife and authorize the control of wildlife which are destructive to crops, agriculture or that constitute a nuisance or health threat. The department may enter into agreements with the United States to accomplish these objectives (Hawaii Revised Statutes §183D-2, §183D-8, §183D-61)

Hawaii Department of Agriculture
The Hawaii Department of Agriculture, Animal Industry Division is the state agency responsible for the prevention and eradication of contagious, infectious, and communicable diseases among animals. The department may cooperate with the United States Department of Agriculture in its efforts to eradicate any transmissible disease of animals, and to inquire into the causes of such diseases (Hawaii Revised Statutes §142-1, §142-3, §142-21).

1.8.2 Compliance with Federal Laws, Executive Orders and Court Orders

Several federal laws, Executive Orders, and a court order regulate wildlife damage management. Wildlife Services complies with the following laws, relevant to this proposal, and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act NEPA requires that Federal actions be evaluated for environmental impacts, that these impacts be considered by the decision maker(s) prior to implementation, and that the public be informed. This EA has been prepared in compliance with Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and the APHIS Implementing Guidelines (7 CFR 372). In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Invasive Species (Executive Order 13112). The Invasive Species Executive Order directs Federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm, or harm to human health.

Endangered Species Act. It is Federal policy, under the ESA, that all Federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). If any federal action may affect endangered species, Section 7 consultations with the USFWS are conducted to use the expertise of the USFWS to ensure that "any action authorized, funded, or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species. Each agency shall use the best scientific and commercial data available" (Sec. 7(a)(2)).

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into any selected program as implemented by Wildlife Services or other cooperating agencies must be registered with and regulated by the EPA and the HDOA, and used in compliance with labeling procedures and requirements. No chemical control methods were proposed.

Protection of Children from Environmental Health and Safety Risks (EO13045) Children may suffer disproportionately from environmental health and safety risks for many reasons. The activities proposed in this EA would be modified in consideration of the potential for exposure to children. It is highly unlikely that children would be adversely affected by the methods proposed. Therefore,

implementation of the proposed action would not increase environmental health or safety risks to children.

Impacts on minority and low income persons or populations (Environmental Justice and Executive Order 12898) EO 12898 requires Federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low income persons or populations. All of Wildlife Services activities are evaluated for their impact on the human environment and compliance with EO 12898 to ensure Environmental Justice.

National Historic Preservation Act (NHPA) of 1966 as amended (6 U.S.C. 470 et seq.) The NHPA requires: 1) federal agencies to evaluate the effects of any federal undertaking on cultural resources, 2) consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian tribes or Native Hawaiians to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings.

Texas Freedom of Information Act Decision The U.S. District Court in Waco, Texas issued a judgment on September 30, 2002, enjoining Wildlife Services from releasing any personal identifying information in violation of the Freedom of Information Act (FOIA) and Privacy Act. On February 14, 2003, the court issued a final judgment and permanent injunction. Wildlife Services policy states that it will redact all private cooperator names, including associations, organizations and other such entities as defined by the permanent injunction from its NEPA documents.

Executive Order of August 17, 2007. Facilitation of Hunting Heritage and Wildlife Conservation. This order directs Federal agencies that have activities that have a measurable effect on outdoor recreation and wildlife management, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. It directs federal agencies to cooperate with states to conserve hunting opportunities. Wildlife Services will determine if its activities might have a measurable effect on hunting opportunities and conduct activities in cooperation with game management agencies.

1.8.3 Hawaii State Legal Guidelines

Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife. Title 13, Chapter 123. Rules Regulating Game Mammal Hunting. The Division of Forestry and Wildlife manages feral swine in Hawaii as a game animal. If feral pigs are found on private property and pose a nuisance or threaten damage, that property owner may remove them at any time (HRS 142-91). Wildlife Services operates under a permit issued by DLNR DFW pursuant to Title 13, Section 123-9, which allows taking feral swine that pose a nuisance or

threaten damage to crops, vegetative habitat, or native plants. No limit on take is provided for damage situations.

Administrative Rules for the Division of Forestry and Wildlife also allow for feral swine hunting as defined in Title 13, Chapter 123. Depending on the location, the bag limit is up to one or two feral swine per season for hunters. This information is pertinent to the analysis of total mortality and hunter take will be used to help determine cumulative effects on feral swine in Hawaii County.

County Resolution 134 07 Draft 2 authorizes the Department of Research and Development and a designated council member to coordinate with the United States Department of Agriculture, Wildlife Services to formulate a one-year pilot program to trap invasive feral pig populations in Hawaii island residential communities and agricultural farm lots.

Hawaii Revised Statute 142 Hawaii Department of Agriculture's role in disease monitoring is stated in Hawaii Revised Statute 142 which authorizes the Department to inquire into the causes of transmissible diseases of animals.

CHAPTER 2: DESCRIPTION OF ALTERNATIVES

2.1 Alternative 1 - Proposed Action

General Strategy

The proposed action is an integrated feral swine damage management approach wherein the most effective, selective and environmentally desirable method or combination of methods allowed under this alternative would be tailored to site-specific field conditions. Based on variables encountered in the field such as location, land use, vegetation type, nature of damage, and number of pigs, the Wildlife Services specialist would decide which of the allowable direct control methods, as well as technical assistance (advice or recommendations) would be most suitable. The USDA Wildlife Services Decision Model (Slate et al., 1992) is the standard undocumented professional decision making model which would be applied on a case-by-case basis to formulate site specific strategies to remove swine within the guidelines established in this EA.

Wildlife Services has the legal mechanism to work on private residential and commercial property with the owner's written permission. Wildlife Services would coordinate with state and county officials, industry groups and landowners before initiating control operations. Operations must be requested by the landowner and an agreement to work on private property must be signed by both the landowner and Wildlife Services.

Depending on the location and circumstances of the reported wildlife problem, the tools used for controlling feral pigs would be cage traps, corral traps, leg snares, opportunistic shooting (where applicable and allowable) and the use of dogs. Cage traps would be the primary and preferred method of pig removal. Its benign nature, low risk of non-target take, high safety level to Wildlife Services personnel as well as residents once the pig is trapped, and the humanness of the device make it the method of choice in this proposal.

Providing assistance

A 24-hour hotline phone system would be in place to receive calls from the general public regarding feral pig problems. Services would be rendered on a first-come, first-served basis with the exception of immediate human health and safety situations. All calls would receive a verbal response by the next business day. Site assessments will then be conducted to determine the location, severity, estimated number of animals involved and applicable damage management methods. A prioritized response system would be implemented to promptly address immediate human health and safety situations. The list of response priority follows:

1. Aggressive feral pigs posing immediate human health and safety threats. This response is without regard to the number of animals or properties involved, as well as type(s) of property.
2. Feral pig activity within a neighborhood where, collectively, multiple properties (parcels under 5 acres) are being negatively impacted.
3. Feral pig activity on a single residential property or parcel under 5 acres.
4. Feral pig activity on a parcel exceeding 5 acres.
5. Feral pig activity on the grounds of a public institution.

Zoonotic disease surveillance and cooperation

Feral pigs that are live-captured would have blood samples drawn for disease surveillance. Blood samples would be submitted to the Veterinary Laboratory Branch of the Hawaii Department of Agriculture located on Oahu for testing. Submission of samples and supplies required for collection and submission would be the responsibility of Wildlife Services. Test results received back from the Laboratory would be incorporated in reports that would be furnished to Hawaii R&D.

Carcass disposition

All pigs would be either euthanized on site (if appropriate and allowable) or taken off-site for euthanasia, and properly disposed of per local statutes and Wildlife Services policies. Large, lockable chest freezers would be placed at strategic locations (preferably County baseyards) throughout the county to stockpile carcasses so as to minimize the number of trips required to the designated landfill.

2.2 Alternative 2 - No Action Alternative

Under this alternative, Wildlife Services would not assist the County of Hawaii to remove feral swine as described in the proposed action. No direct operational control or technical assistance would be offered to residents or the County.

2.3 Alternative 3 - Integrated Management with Option to Relocate to Public Hunting Areas

This action is proposed to address the concerns that hunting groups raised during informational meetings on the Island of Hawaii which underscored the economic and social value of feral swine for hunting. This alternative differs from the proposed action in that swine would be captured live in cage traps or corral traps and would not be euthanized if landowners chose not to retain the carcass, and DLNR approved a relocation site. Blood samples would be taken from live captured animals regardless of disposition. If approved by DLNR's Division of Forestry and Wildlife, and if the landowner desired the relocation option, live captured animals would be ear tagged and relocated to the nearest public hunting area and released. If results of blood tests

indicated the presence of brucellosis or pseudorabies in the sampled pig, those results, identification information on tag number and release site, and precautionary information relating to the identified disease would be provided to hunting organization leaders.

CHAPTER 3 - ISSUES IMPORTANT TO THE ANALYSIS OF IMPACTS

3.1 Issues Driving the Analysis

Issues are used to drive the analysis in Chapter 4, Environmental Consequences. Each major issue will be evaluated under each alternative and the direct, indirect and cumulative impacts will be estimated where applicable. The cooperating agencies determined through interagency consultation and through initial public involvement that the following issues should be considered in the decision making process for this EA to help compare the impacts of the alternatives.

- What would be the potential effect on the feral swine population in Hawaii County? How many pigs would be removed? What is the cumulative effect on feral swine in Hawaii from all actions form past, present and future actions?

- What potential non-target impacts could occur from implementing feral swine control? Could the proposal affect threatened and endangered species or other sensitive species? Could it affect other non-target animals? Could people's pets be harmed by the proposed activities?

- What social and economic values may be affected? How does the public view the presence of feral swine in Hawaii. Are swine control actions perceived as cruel or inhumane? What would be the economic effects of controlling feral swine?

- What disease potential might there be for humans, wildlife, and domestic animals as a result of implementing the alternatives?

- Might there be any effect on other environmental resources?

3.2 Issues Not Analyzed in Detail with Rationale

There are no significant irreversible or irretrievable commitments of resources other than the minor use of fossil fuels for routine vehicle operations. The proposed activities will not have an impact on unique characteristics of the geographic area such as park lands, prime farmlands, natural areas or ecologically critical areas because no work or relocation activities would occur in or near these areas. These resources will not be analyzed further. The methods proposed do not alter the physical environment.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides information needed for making informed decisions on feral swine damage management objectives identified in Chapter 1 and alternatives described in Chapter 2. This chapter uses the issues identified in Chapter 3 as the evaluation criteria. Each of the issues will be analyzed for its environmental consequences under each alternative.

Each major issue will be evaluated under each alternative and the direct, indirect and cumulative impacts will be estimated where applicable. NEPA describes the elements that determine whether or not an impact is "significant." Significance is dependent upon the context and intensity of the impact. The following factors were considered to evaluate the significance of the impacts on the human environment that relate to context and intensity (adapted from USDA 1997, revised for this proposal).

- magnitude of the impact (size, number, or relative amount of impact) (intensity)
- duration and frequency of the impact (temporary, seasonal impact, year round or ongoing) (intensity);
- likelihood of the impact (intensity);
- geographic extent; how widespread the program impact might be (intensity); and
- the legal status of a species that may be affected by the action (context)

4.1 Alternative 1 - Proposed Action

4.1.1 Effect on feral swine populations in Hawaii County

Population data or estimates for feral swine in Hawaii do not exist (Personal Commun. R. Imoto, DLNR). Hunting records and damage complaints indicate that feral swine are abundant and their populations are probably stable, if not increasing. Reported hunter harvest in the past three state fiscal years was, 414 in 2005 reporting year, 465 in 2006 reporting year, and 456 feral pigs in the 2007 reporting year (July 2006 to June 2007). These are the numbers harvested and reported by hunters at self check stations around the island. An additional 25 percent each year, (e.g. 114 in 2007) were probably taken and not reported (personal communications with W Taka, and R. Covington, Division of Forestry and Wildlife, DLNR, 2007).

Wildlife Services has removed over 100 feral pigs in the last fiscal year but expects that the number would increase to approximately 300 to 400 individuals or more over the next year. It is estimated that within the next year, total take from hunters and poachers would be approximately 570 (based on 2007 mortality of 456 legally hunted and 114 removed by poachers). When added to Wildlife Services' estimated future take of up to 400 individuals, could increase the total estimated future take on the island to almost 1000 pigs. In addition, feral pigs have been removed by other management agencies on the Island of Hawaii, averaging 222 island wide each year over the last three years, to place the cumulative expected take at over 1222 pigs. This figure could be higher if take by other sources is increasing.

This proposal does not include an extension on the agreement with the county beyond the one year program. In the event that Wildlife Services continued to provide services to individual landowners, any continued take would be expected to be substantially reduced.

While population levels in the county are not known, a short term removal of this magnitude suggested here is probably unlikely to affect the feral swine population. While eradication is not a goal, Ditchkoff and West's (2007) note that feral hogs are almost impossible to control or eradicate due to their extremely high reproductive levels is relevant to this analysis. Feral hogs have the highest reproductive rate of any ungulate species (Read and Harvey 1989). Research in Australia suggests that feral hogs can withstand a 70 percent population reduction and rapidly return to pre-control levels (Dziecolowski et al. 1992). More locally, Hess et al. (2006), estimated that an annual removal of up to 43 percent in Kakalau Forest National Wildlife Refuge would be necessary to affect a decline there. Based on several factors including the focus of control occurring on small private parcels of land; the constraints on available staffing and funding; the relatively time and labor intensive task to successfully capture feral pigs; and the ability of Wildlife Services to only respond to the most urgent requests for assistance, it can intuitively be concluded that while localized population reduction is expected to occur on properties receiving damage assistance, the feral pig population on the island will not be affected by this proposal, even if the proposed action were to expand or continue into the foreseeable future.

Applying the significance criteria from USDA (1997, revised) as defined on the previous page, the magnitude of impact is probably moderate to low as described above; the duration and frequency of the impact would be temporary, the likelihood of the impact is high (it is likely to occur), while the geographic extent is low (only sporadic and localized effects). Taking into consideration the legal status of the feral pig, which is not protected on private lands when damaging property, nor is it a native species, we conclude that there would not be a significant effect on the feral pig population in Hawaii County.

4.1.2 Impact on Non-target Species

The proposed action would use cage traps as a primary and preferred method of capturing pigs. Cage traps are used around residential areas to limit negative consequences on non-target animals. Cage traps can also capture free roaming pets or other animals such as small livestock, however, placement and baiting practices minimize non-target take. Since cage traps are checked on a daily basis, any non-target animal that may be captured in the trap could be released unharmed. Therefore, cage traps would have no notable negative effect on non-target species.

Shooting is target specific and used primarily for euthanizing pigs once they are captured in cage traps and leg snares. No non-target effects would be expected to occur from shooting. Non-lethal leg snares would only be used in locations where cage traps are not effective and where it does not pose an evident risk to pets or other animals. The potential for capturing free roaming dogs in a leg snare exists, but would be minimized by placement in pig travel lanes and notification of landowners.

Trained trailing dogs would be used to 1) track potentially injured feral pigs that were once captured, but have escaped trapping devices; and 2) to pursue and remove harmful individuals that are posing immediate human health and safety threats that can not be otherwise trapped. This method is not expected to have an effect on non-target animals because these dogs and their handlers are trained and experienced, the dogs follow the target animals. Radio tracking collars will be used on trailing dogs to facilate recovery and prevent dogs from getting lost. The use of dogs is expected to be minimal, if any at all.

The methods proposed are likely to benefit non-target species by removing a destructive omnivore that can do direct damage by predation, and indirect damage by habitat destruction.

4.1.3 Social and Economic Values

Section 1.4 discussed that feral swine in Hawaii are a valued game species, contributing recreational opportunities and playing an important role in the diet and social lives of many local families. Some people are concerned that removing feral pigs for damage management activities would affect hunting opportunities and be a waste of an important food resource.

Feral swine would only be removed from private property where the owner or land manager has requested assistance in alleviating damages. No feral swine would be removed from public hunting areas. Feral swine that are located on private property and are causing damage are no longer considered to be a public resource (personal communication R. Imoto, 2007). Private land owners have asked for government assistance to remove the pigs, and therefore, the proposed action would not directly affect the ability of the public to hunt and use the target animals on private lands. Euthanized swine would be offered to the landowner for personal consumption or are disposed of in a landfill if the property owner does not wish to retain the carcass. Wildlife Services will advise property owners to fence property if economically feasible and justified, thereby eliminating future feral pig incursions and damages and the need for government expenditures to protect private property.

Feral swine that are causing damage on private lands would primarily be cage trapped and euthanized. This is considered to be as humane an option as is feasible.

The proposed action is intended to temporarily alleviate economic damages on properties where crops, landscaping and other resources are being damaged by feral swine, therefore the proposed action would provide some economic benefit by stopping or reducing further damages. The amount of damage occurring prior to pig removal has not been compiled since there has not historically been a program to address feral swine damages. Monitoring of the program after the one-year pilot project will reveal a sample of damages and estimated dollar amounts.

4.1.4 Disease Issues

Due to the possibility of humans contracting zoonotic porcine diseases harbored in some feral pig populations, no carcasses would be officially donated to charity organizations, and swine will not be transferred live under this alternative. Should property owners choose to retain the carcass for home consumption, Wildlife Services would presume no liability on behalf of Wildlife Services and Hawaii County R&D. Literature on swine brucellosis would be provided to individual members of the public when such an arrangement for disposal would take place (See Appendix 1).

In addition to providing information to carcass recipients, information on swine diseases, including advice to prevent exposure to potential brucellosis was provided to the public both verbally, and in literature disseminated at the public meetings.

The proposed action includes taking blood samples of all suitable carcasses to test for brucellosis and pseudorabies. The intent of this action is to determine the prevalence of these diseases on the island so that management agencies can use this information to better identify the location and prevalence of these diseases, and manage accordingly. While no other recent data exist on the prevalence of these diseases, samples submitted to date are revealing the presence of both brucellosis and pseudorabies.

Swine carcasses do not pose a disease threat to humans, livestock, or other animals if handled properly. Literature provided to carcass recipients outlines proper handling and precautionary procedures.

4.1.5 Other Environmental Effects

The proposed action would potentially provide benefit to vegetation, soils, wetlands and native species by removing non-native animals that cause habitat destruction by rooting behavior and feeding/predation on native plants and animal species.

The proposed capture methods would not be used in previously undisturbed areas, nor would they cause major ground disturbance, therefore they would not have the potential to affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, or cause a loss or destruction

of significant scientific, cultural, or historical resources. The proposed methods do not have the potential to affect historic properties, soils, vegetation or water quality when used in the proposed locations.

4.2 Alternative 2 – No Action

4.2.1 Effect on Feral Swine Populations in Hawaii County

Under this alternative, Wildlife Services would have no action on feral swine in Hawaii County other than occasional damage management responses outside of the County program. The State of Hawaii DLNR would probably provide a limited amount of assistance. Feral swine populations that could not be hunted by private hunters or removed by private pest control operators would continue to thrive in areas where they conflict with residential and agricultural practices.

4.2.2 Impact on Non-target Species

Wildlife Services would have no effect on non-target species under this alternative. Negative impacts on other species may increase without control actions.

4.2.3 Social and Economic Values

Wildlife Services would have no effect on the social or economic resources associated with feral swine. Presumably, private damage control operations and hunters would be used to assist private landowners with swine that damage some properties. Because wildlife is a public resource, many members of the public expect government agencies to assist with wildlife damage management. This alternative would not fulfill that expectation in terms of providing a federal source of assistance. Economic damages would be expected to continue or grow without assistance.

4.2.4 Disease Issues

Wildlife Services would not participate in disease surveillance activities under this alternative, nor would it participate in dissemination of information about swine diseases.

4.2.5Other Environmental Effects

Wildlife Services would have no other positive or negative environmental effects since it would not take action to manage feral swine damage.

4.3 Alternative 3 – Selective Relocation to Public Hunting Areas

4.3.1 Effect on Feral Swine Populations in Hawaii County

Under this alternative, Wildlife Services would have the option to relocate live pigs if the landowners did not wish to retain the carcasses of euthanized pigs, and wished the live pigs to be transported to hunting areas instead of being euthanized. Under no circumstances would live pigs be provided to landowners. Live pigs could be transported to public hunting areas as designated by DLNR DFW. The criteria for transferring live pigs to hunting areas would be: 1) no federal or state-designated threatened or endangered species may be present in the hunting area; 2) no natural areas could receive live pigs; 3) pigs would be ear tagged and blood samples would be collected for disease identification before transport; and 4) local hunting organizations would be provided with positive results of disease sampling to provide to its membership. The number or percentage of pigs that may be relocated could not be precisely determined since it would be decided by the landowners on a case-by-case basis. Presumably, some landowners would wish to retain carcasses for home consumption while others would wish that the pigs be allowed to roam free in another location. Still others may determine that they do not want to experience the potential return of those pigs and so they may request euthanasia even if they do not wish to retain the carcass. The effect on the feral swine population under this alternative would likely to be somewhat lower overall than the proposed action, since some pigs would be returned to public lands.

4.3.2 Impact on Non-target Species

The method of live capturing swine would have the same effect as the proposed action. A negative indirect effect on non-target species under this alterative is likely to be greater than under the proposed action because swine that are released into public hunting areas could move out of such areas and potentially modify native plant and animal communities and prey on other species. It is also possible that released pigs would roam back onto private lands where they could threaten wildlife, livestock, or pets. Unless the public hunting areas were topographically isolated, swine could range into other land jurisdictions.

4.3.3 Social and Economic Values

Relocating captured swine to public hunting areas would provide additional hunting opportunities in those areas. This would benefit those people who rely on pig hunting for economic, nutritional, recreational and/or other social benefits.

The possibility that relocated swine may roam into jurisdictions outside of the hunting areas, adds potential liability to additional property owners.

4.3.4 Disease Issues

Wildlife Services would participate in disease surveillance activities under this alternative. Blood samples from swine would be taken prior to any animals being

relocated. However, tests would not yield results prior to relocation. It is possible that transported swine could become new vectors for disease transmission. However, because swine would be relocated to the nearest public hunting area meeting the criteria described in Section 4.3.1, it is likely that any diseases that would be identified would already be present in the target population. However, this information would not be known until after the animals were relocated. Under this alternative, swine would be ear tagged prior to relocation so that positive disease test results could be provided to the hunting community through local hunting organizations.

4.3.5 Other Environmental Effects

Relocating feral swine is likely to have at least some negative effect on soils, vegetation, wetlands, and potentially other species since high numbers of feral swine can be environmentally destructive. Wildlife Services would defer judgement to the DLNR DOFAW as to whether they felt that feral swine relocation could provide sufficient social and economic benefits so as to outweigh the risks to the natural environment. Public hunting areas and game animals are managed by DLNR DOFAW, thus, this is an appropriate decision for the agency.

On a national level, an increase in the population of feral swine is causing concern among wildlife managers due to the negative effects on the physical and biological environment and the potential to spread diseases to humans, livestock, wildlife, and pets.

While the methods proposed do not affect cultural resources, relocation of swine under Alternative 3 could cause indirect ground disturbance. Relocating swine to public hunting areas may require the review of the State Historic Preservation Officer, to determine if relocation activities would add any risk to undiscovered artifacts or unrecovered cultural resources in or near target public hunting areas. Because public hunting areas already contain feral swine and are therefore previously disturbed, the effect is not expected to require further review. The proposed capture methods would not be used in previously undisturbed areas, nor would they cause major ground disturbance, therefore they would not have the potential to affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, or cause a loss or destruction of significant scientific, cultural, or historical resources. Wildlife damage management generally does not have the potential to affect historic properties.

4.4 Monitoring

The USDA Wildlife Services program actively monitors the effects of its programs to determine if the effects fall within projected results. When program environmental effects are substantially different than projected, or if new environmental issues arise, new information becomes available, the regulatory framework changes, or a new reasonable

alternative that should be considered is identified, the USDA Wildlife Services may determine that additional NEPA compliance measures are necessary. Any feral swine control program resulting from this EA would be monitored in three different ways:

1. Management Information System (MIS). A primary record keeping system established by Wildlife Services is the MIS. The MIS will record the target animals taken, any non-target animals affected, and methods used. Review of the MIS facilitates a determination of whether or not program impacts will fall within levels determined through this EA.

2. NEPA Monitoring and Review. It is Wildlife Services policy to review all NEPA documents to determine if they are still valid or if substantial changes warrant additional NEPA compliance. Wildlife Services routinely reports on its findings to the Federal Decision maker to ensure that NEPA compliance is up-to-date. Wildlife Services NEPA documents and/or decisions are normally reissued to the public every 5 years at a minimum, and sooner if new information substantially changes the proposed action, issues, alternatives or environmental impact findings.

3. Adaptive Management: Wildlife Services, in collaboration with cooperating agencies, will continue to collect information on disease presence, non-target plant and animal impacts, and other effects. New information would be considered against the selected alternative to determine if program changes are warranted. Substantial program changes may warrant additional NEPA compliance and public involvement

4.5 Conclusions

The action proposed by this environmental assessment is the implementation of an Integrated Pest Management approach to control the damage of feral swine on localized, mostly residential properties in Hawaii County. No significant negative impacts would be expected from the implementation of the proposal. The proposed action is intended to provide benefit to Hawaii's economy and ecology by reducing negative economic and environmental impacts from feral swine damage. The proposed action is also intended to provide information to resource management agencies and to the County of Hawaii regarding the nature and extent of feral swine damage and the prevalence of brucellosis and pseudorabies. The information will be used to assess the need for future control efforts. Wildlife Services proposal includes the potential to continue a feral swine damage management assistance program, depending upon the need for continued federal assistance, and if funding is made available by other sources. The County of Hawaii does not intend to continue funding the proposed program beyond one year.

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Brucellosis

(undulant fever, Bang's disease)

What is brucellosis?
Brucellosis is a disease caused by *Brucella* bacteria, which are mainly spread among animals. Brucellosis is found in many parts of the world and can be spread easily through the air. This organism is of concern as a possible bioterrorist weapon.

How do you get it?
Humans can become infected by coming in contact with animals or animal products that are contaminated with the *Brucella* bacteria. This can occur in three ways: eating or drinking something that is contaminated with *Brucella*, breathing in the organism (inhalation), or having the bacteria enter the body through skin wounds.

The most common way humans become infected is by eating or drinking contaminated milk products. When sheep, goats, or cows are infected, their milk is contaminated with the bacteria. If the milk is not pasteurized (heated), these bacteria can be spread to persons who eat or drink the milk products.

Breathing in *Brucella* organisms is not a way of becoming infected, but it can be an important danger for people in certain jobs, such as those working in laboratories where the organism is grown. Contamination of skin wounds may be a problem for persons working in slaughterhouses or meat packing plants or for veterinarians.

Hunters may be infected through skin wounds or by accidentally ingesting the bacteria after cleaning infected animals. Hunters should use rubber gloves when skinning and gutting animals. This disease is not usually spread person to person. However, there have been rare cases of sexual and breast-feeding spread.

What are the symptoms of brucellosis?
Symptoms include fever, sweats, headaches, back pain and physical weakness. Severe infections of the central nervous system (brain and spinal cord) or lining of the heart may occur. Sometimes, brucellosis can cause long-lasting or chronic symptoms that include repeated fevers, joint pain, and fatigue (tiredness).

When do symptoms start?
The symptoms usually begin 5 to 60 days after exposure to the bacteria with onset of 1-2 months commonplace.

What is the treatment for brucellosis?
Early treatment is important in brucellosis cases. A doctor can prescribe the appropriate medicines to treat the infection.

How can you keep from getting it?
• Do not drink unpasteurized (raw) milk or eat dairy products (including cheese) made from unpasteurized milk.
• Avoid contact with tissues, blood, urine, and aborted fetuses from infected animals.
• Dogs can become infected and spread brucellosis. If you think your pet has been infected, call your veterinarian. People with immune system deficiencies should not handle dogs infected with brucellosis.

For more information, see the CDC's website at http://www.cdc.gov/ncidod/diseases/submenus/sub_brucellosis.htm

Fact Sheets
Revised 3/31/2005
Disease Investigation Branch